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White Heifer Disease

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(*Continued from page* 409.)

AETIOLOGY

From the embryological standpoint, and also from the identical nature of the defect to Fincher & Williams' (1926) sterile heifers, it seems evident that "white heifer disease" is the result of an arrested development of the Muellerian ducts. These structures arise from the cell mass of mesodermal somites (Patten, 1931) and they give rise in turn to the oviducts, uterus, cervix and vagina. The ovaries arise from the lateral mesoderm, the urinogenital sinus from the endoderm, and the vulva from the ectoderm. Significantly, the ovaries and the vulva are never involved in "white heifer disease."

The actual stage at which the developmental arrest takes place cannot be pronounced without more research work concerning ante-natal embryology and pathology. It is probable, however, that the inhibition of growth must extend over a period of time and that its moment of onset may differ considerably on either side. Indeed, one side may not be affected at all, thus giving rise to *uterus unicornis*. The Muellerian ducts may only fail to become orientated at their caudal extremities, thus creating Group C heifers with an imperforate hymen only. The median walls of the ducts may persist, producing a *uterus didelphys*, or, more commonly, a vertical band across the external os (for references, see Spriggs, 1945). Finally, different degrees and sites of arrest cause varying manifestations of uterine and vaginal hypoplasia, together with multiple cystic formations of diverse dimensions, as seen so frequently in "white heifer disease." On the whole, the right side has been affected slightly more frequently than the left one, but some bulls give rise to a preponderance of one-sided abnormalities.

It has been indicated (see pages 407 and 408) that in the free-martin, the findings are quite different from those in "white heifer disease," the genital tract being even more rudimentary. Two hypotheses have been propounded to explain the origin of the former. Keller & Tandler (1916) and Lillie (1917) say the male hormone of the co-twin influences the female ovum through the vascular anastomosis of the chorions. Williams (1934) suggests that the freemartin is the product of an imperfect twin ovum, discharged by a diseased ovary. It is clear that neither of these theories will explain the "white heifer disease" syndrome. No case has yet been recorded where the animal was a twin.

GEOGRAPHICAL DISTRIBUTION AND INCIDENCE

The individuals which provided the material for this investigation, emanated from Southern England, the Midlands and Wales. Cases are described in the literature from all parts of England and Scotland, with one report each from Ireland, U.S.A. and South Africa. No mention of the condition could be traced in any continental periodicals. This distribution corresponds, in the main, with the prevalence of the Shorthorn breed.

No data at all are available on the incidence of the disease, but the author's impression, and it is only an impression, gleaned by talking with many veterinarians and cattle breeders, is that approximately 10 per cent. of white Shorthorn heifers are affected in one way or the other. Owing to hereditary conditions, however, this figure is certain to fluctuate considerably in different areas.

INHERITANCE

All the cases which have been fully reported in this paper were in white Shorthorns. It is significant that all the specifically described animals in the literature have also been totally white Shorthorns, although the condition is stated to have been occasionally encountered in roans and still more rarely in red or red-and-white Shorthorns. (See Patrick, 1902; O'Connor, 1930; Tutt, 1939; Hart, 1939; Day, 1934.) All the available evidence, therefore, suggests that there is a close relationship between the white colour and the expression of the condition. That it should occur in other than white heifers is what might be expected on genetical grounds, assuming that there is a factorial association between colour and the condition.

Dealing with the inheritance of coat colour in the Shorthorn breed, Finlay (1924) points out that all white animals carry and transmit a factor for red, this being often expressed by the presence of red eyelashes or patches of red in the ears. The factorial difference between a red and a white Shorthorn is that the red one carries an extension factor, thus producing a red colour all over, whilst the white animal carries a restriction factor, limiting the colour to certain areas. This statement is supported by the observation that white Shorthorns seldom consistently breed true.

The coat colour in the ancestors of five of the heifers described in this investigation was obtained. Two have had a white dam, and three a roan one. Four had a roan sire, and one a red-and-white sire. The grandparents were of mixed colours with only one white animal amongst them. Three heifers had no pure white ancestors traceable. The limited evidence indicates that the presence of a predominantly white colour in either parent or grandparent is not essential for the transmission of the factor responsible for the condition. It also suggests that the dam plays just as important a part as the sire in its transmission.

The hereditary nature of the disease has been recognized by several observers (Blackwell, 1923; Stinson, 1925b; Forrest, 1944) who state that the bull was responsible for perpetuating the defect. The white Shorthorn bull described by Forrest, sired about 20 normal roan and red heifers and ten abnormal white heifers. Only one of the three bulls described was white, showing that the whole white colour in the sire was not a prerequisite for the transmission of the abnormality to the progeny. This can be confirmed by the history of the roan sire of Case No. 8 (see page 418).

It is recognized that many pedigree Shorthorn families are ultimately traceable to a comparatively small number of common ancestors (Storer, *ca.* 1890). It may be surmised, therefore, that if the factor responsible for "white heifer disease" was present amongst these early ancestors, it may now be fairly widely disseminated in the breed. That a close relationship among the immediate forbears is not essential for the expression of the defect is illustrated by the findings in this study, for there was evidence of slight in-breeding in only one out of five heifers. Every animal, however, was a pedigree Dairy Shorthorn, in which the degree of ancestral relationship is likely to be higher than in non-pedigree Shorthorns or cross-bred cattle. It may, therefore, be concluded that "white heifer disease" in the Shorthorn breed is transmitted as a recessive character and that its expression is sex-limited.

A similar condition has been clinically observed in other breeds, *e.g.*, Aberdeen-Angus (Hart, 1930), Guernsey (Stewart, 1944), Jersey (Day, 1944), and an almost totally white Ayrshire (the present author). The comparative infrequency with which it has been reported in these breeds suggests that its incidence is very low. Genetically, it would appear that the factor for "white heifer disease" is not widely disseminated in other than the Shorthorn breed. The condition may, however, arise through close in-breeding, as recorded by Fincher & Williams (1926) in a Holstein herd.

The data available in this study is insufficient to define the exact nature of the association of total white coat colour in Shorthorns and the expression of the disease. It has not been recorded in other white breeds, *e.g.*, Park cattle.

CONTROL

From the foregoing paragraphs, it becomes plain that a breeding policy aimed at eliminating the condition from a herd, merely by a rigid selection of colours, is impracticable. Any combination of colours, except perhaps a red bull on a red cow, is liable to produce an occasional white calf, and roan bulls are almost as likely to transmit the condition as white ones. As it is not a common practice with Dairy Shorthorns to use a white bull on a white cow, this factor undoubtedly has a limiting effect on the number of white offspring and consequently on the incidence of the disease. Moreover, white bulls are reserved, where possible, for red and dark roan cows, whilst white cows are served by red or dark roan sires, in order to achieve the desirable roan or red-and-white colours. Thus pure whites are certainly not encouraged. Any departure from these orthodox practices should be condemned, and Williams' (1921) advice to "eliminate the defect by careful breeding" would appear to be quite incapable of operation.

From a veterinary and agricultural standpoint, therefore, prophylaxis must largely depend on the early detection of affected animals and appropriate measures being adopted in "tainted" herds. It is recommended that all white Shorthorn heifers should

be examined *per rectum* before, or at the time of, breeding age. Light-coloured offspring from a white parent might well be included in this category. Special care must be lavished by the veterinarian on such animals during routine pregnancy diagnosis.

When once the defect has been identified in a herd, all other female offspring from the sire in question should be examined for the possible presence of genital aberrations. A sire known to be a carrier of the defect might be retained for use on red and dark roan cows only, although ideally the extinction of both breeding partners is the eugenic procedure. All in-breeding must be discouraged, in order to prevent any undue homozygosity. To sum up, it may be regarded as unlikely that excessive perpetuation of the defect will take place under present breeding methods.

DISCUSSION

As a result of this study, the following general definition of "white heifer disease" is offered:—

"White heifer disease is a gross genital defect having an hereditary basis and occurring most commonly in white heifers of the Shorthorn breed; the abnormality results from arrested development of the Muellerian ducts, and is characterized by a severe, asymmetrical hypoplasia of the uterus, cervix and vagina, together with a partial or complete constriction of the hymeneal ring."

The name "white heifer disease" has been condemned as clumsy and meaningless (Crosfield, 1939; Day, 1944), but having now been in currency for half a century, it is not likely to be suddenly replaced by another title, however descriptive of the condition. Moreover, the diversity of its manifestations makes the task of renaming a most unenviable one. For colloquial terminology, perhaps the slight alteration to "white Shorthorn disease" would be more apposite, by indicating that the Shorthorn blood was as important as the white factor, but this would not indicate its sex-limited character unless the word "heifer" was retained in addition. From a scientific aspect, all that one could suggest would be a general title, *e.g.*, "Hypoplasia Genitalia" or "Hypoplasia Muelleria," but the writer realizes the shortcomings of both these suggestions and would prefer awaiting fresh elucidation on the nature of the disease before being more specific. In the meantime, the old terminology must remain.

It will be evident by now that there is still room for considerable research work to be done on the whole problem of "white heifer disease" by veterinary clinicians, geneticists, pathologists and embryologists. Admittedly, the defect itself does not cause very great losses or repercussions in comparison with the more frequent manifestations of bovine infertility, but even so, its detailed investigation would be of fundamental importance in the study of both ante-natal histo-pathology and genetical studies in coat-colour transmission. It would appear, for instance, that lowered fertility in white animals is not confined to the species *Bos domesticus*. Wriedt (1924) describes an albino stud where the white stallions were sterile, whereas the incomplete albinos and greys were fertile. Other characters may also be linked up with the white colour, *e.g.*, the high incidence of deafness in white bull-terriers.

Apropos the so-called persistent imperforate hymen, encountered at parturition, the writer agrees with other authors (Williams, 1921; Tutt, 1939) that this is an error of diagnosis. Successful coition could never have taken place. It is probable that such a case is a result of an inflammatory reaction in the hymeneal region giving rise to cicatricial adhesions. It may be caused by the bull at service or possibly as a result of a horn wound from another cow. It is conceivable that individuals with a small hymeneal ring in the first place are more subject to such an injury, but this is not essential, since effectual delivery of living calves has been attained at times (Stinson, 1925b; Zupp, 1933). However, the partially unopened hymen met at calving, although unassociated with "white heifer disease," probably possesses an hereditary origin. Such cases of dystokia may be obstinate to overcome, and all that the veterinary surgeon should strive for is the preservation of the mother's life. Both ethically and economically, attempted future breeding from these animals is ill-advised. Quinlan (1929) mentions a further traumatic factor in the causation of vaginal stricture, namely, over-zealous douching with potassium permanganate or other solutions; such cases, however, are not likely to be very frequent

Summary

1. A detailed study of condition known as "white heifer disease" has been made, and the relevant literature reviewed.

2. The morbid anatomy of eight cases, together with one example each of *uterus unicornis* and a freemartin, is given, and photographs taken of the more important features.

3. The clinical history and findings and the hereditary backgrounds of the animals are supplied where available.

4. It is considered that the disease is essentially a gross genital hypoplasia due to arrested development of the Muellerian ducts.

5. The pathological features are very varied but may be divided into three main groups:—

A. Characterized by a hymeneal constriction, absence of anterior vagina, cervix and uterine body, a cystic distension of the uterine cornua, the presence of well-marked Wolffian bodies, and sometimes sub-mucous channels in the vagina.

B. Characterized by a *uterus unicornis*, with some cystic formation in the abnormal horn, and the presence or absence of a hymeneal constriction.

C. Characterized essentially by a hymeneal constriction, which, if complete, gives rise to an accumulation of fluid in the utero-vagina.

6. There is an absence of symptoms in Groups A and B animals, whilst Group C heifers may exhibit violent straining and acute systemic symptoms. Diagnosis is by careful rectal and vulval examination.

7. The future breeding prospects are poor in Group B and hopeless in Groups A and C. The individual outlook in acutely affected Group C heifers is favourable provided prompt surgical treatment is adopted. This consists of the effective puncture of the hymeneal occlusion in the mid-line, using a trocar and cannula, with the other hand gripping the structure *per rectum*.

8. The condition is a self-limiting one, and total eradication by appropriate breeding programmes on a large scale would not be practical or effective. The disease does not cause a heavy loss to the cattle industry but early diagnosis is essential to eliminate the hereditary tendency on the individual farm.

9. The disease occurs most commonly in the pedigree Dairy Shorthorn breed, most frequently in white heifers and occasionally in roans. It appears to be hereditary, and is not necessarily associated with close in-breeding. Cases are usually encountered sporadically.

10. "White heifer disease" must be differentiated from the constricted hymen occurring at the time of parturition, which is an unrelated condition.

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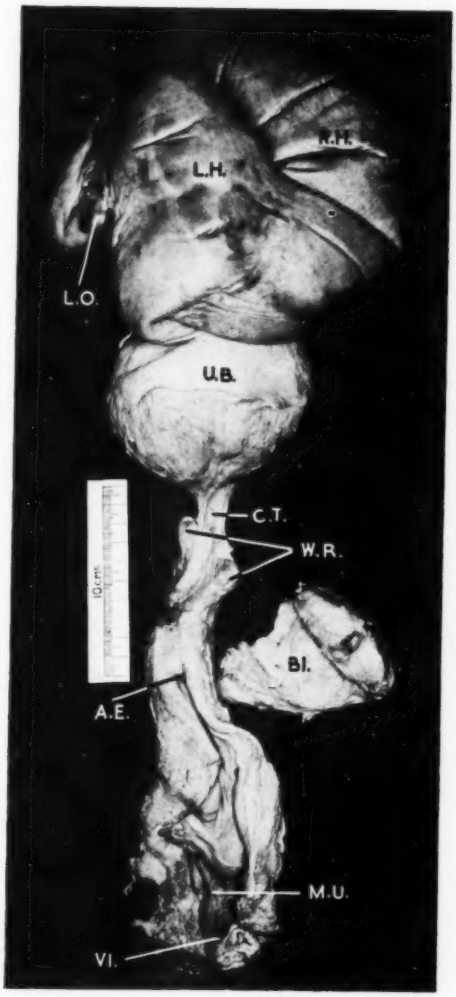

FIG. 1A.

Dorsal view of complete genital tract of Case No. 1.

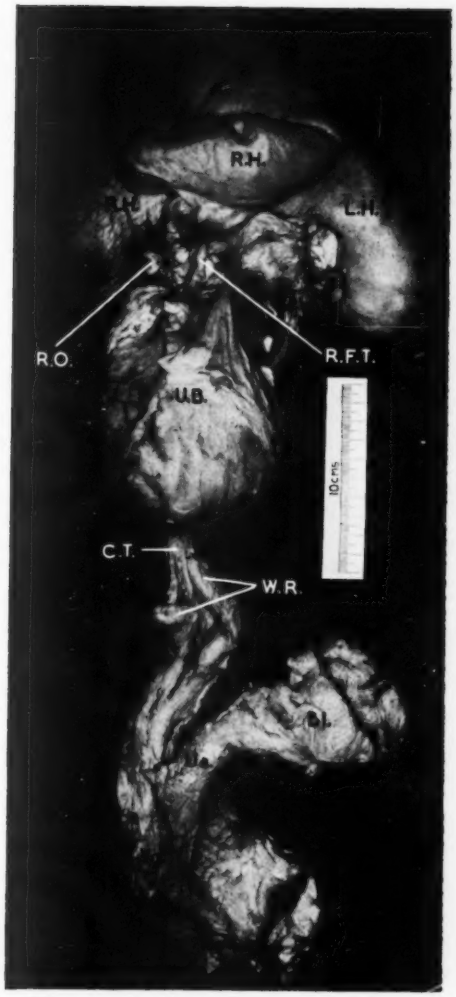

FIG. 1B.

Ventral view of complete genital tract of Case No. 1.

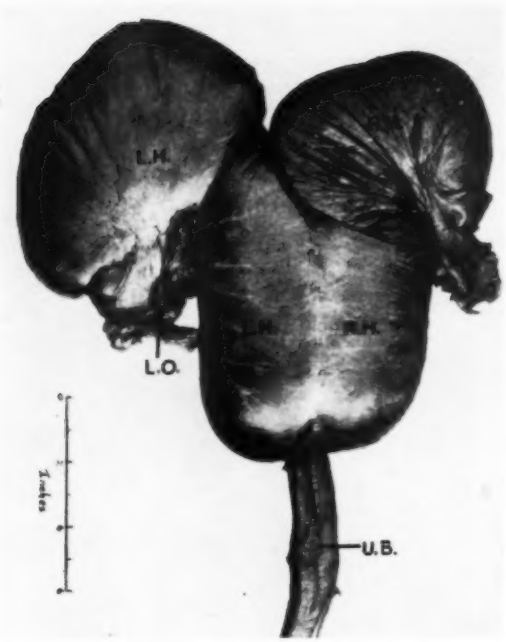

FIG. 2A.
Dorsal view of uterus of Case No. 2.

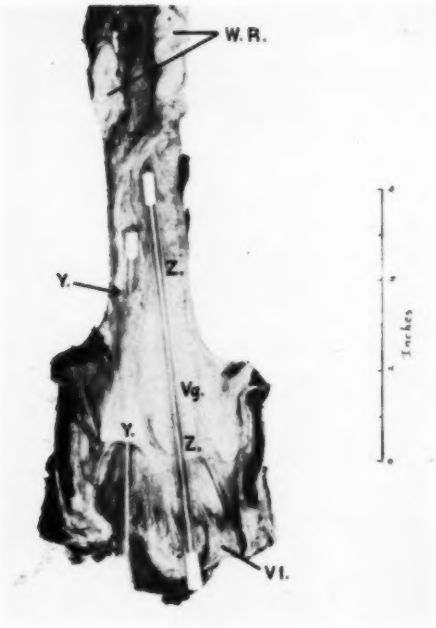

FIG. 2B.
Dorsal view of vulvo-vagina of Case No. 2. The main vaginal lumen has been opened throughout its length, as has an accessory vaginal channel Z. A further channel Y has been incised at its anterior end only.

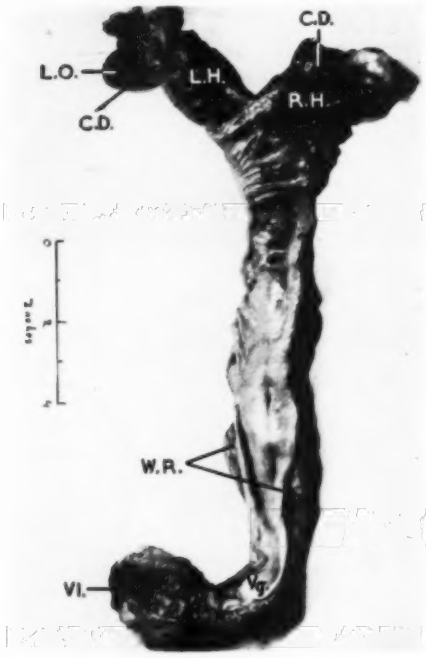

FIG. 3.
Dorsal view of complete genital tract of Case No. 4.

FIG. 4.
Dorsal view of dissected genital tract, excluding vulvo-vagina, of Case No. 5.

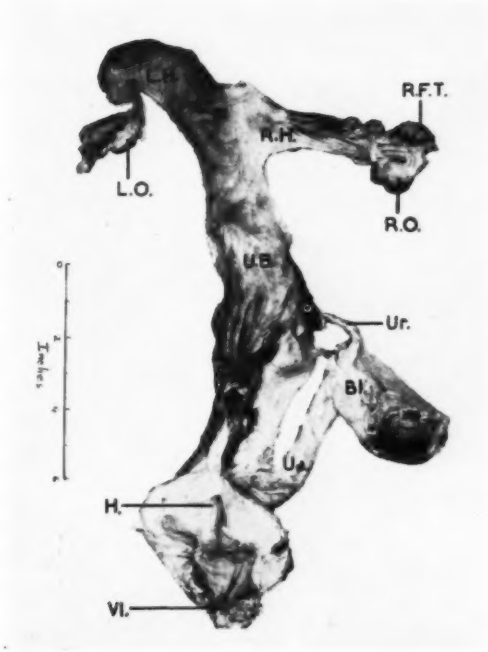

FIG. 5A.

Dorsal view of unopened genital tract of Case No. 6.

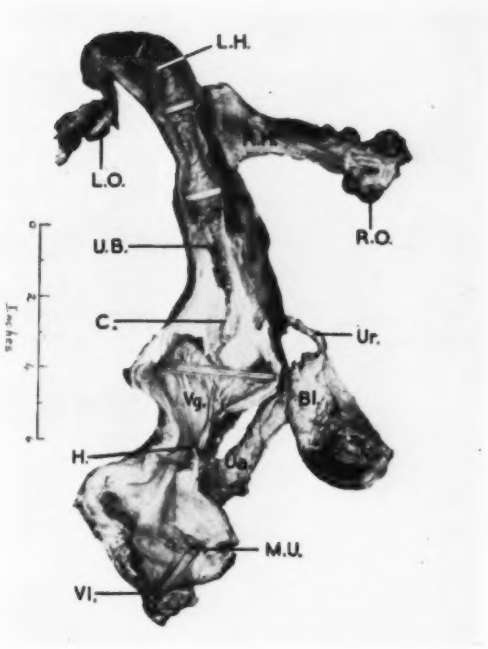

FIG. 5B.

Dorsal view of incised genital tract of Case No. 6.

FIG. 6A.

Dorsal view of complete genital tract of Case No. 9, showing vaginal diverticula (XX and ZZ).

FIG. 6B.

Ventral view of complete genital tract of Case No. 9.

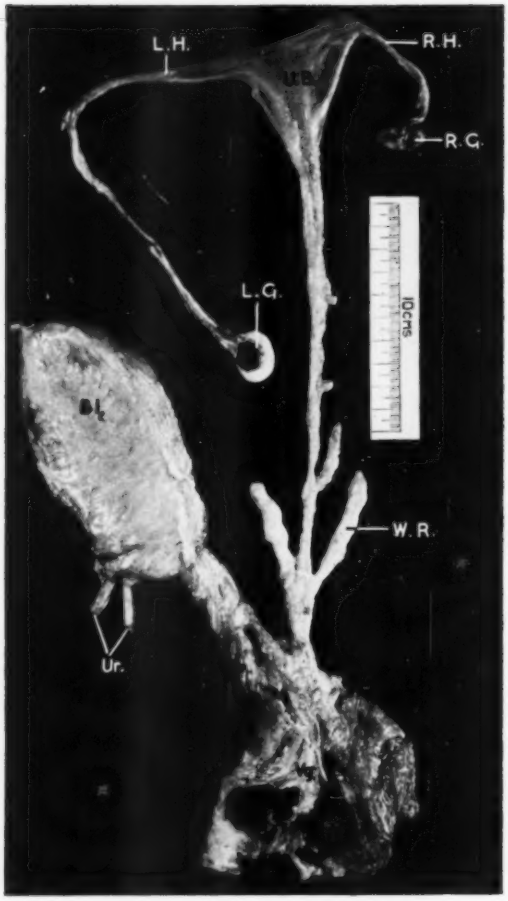

FIG. 7A.

Dorsal view of complete genital tract of a free-martin (Case No. 10).

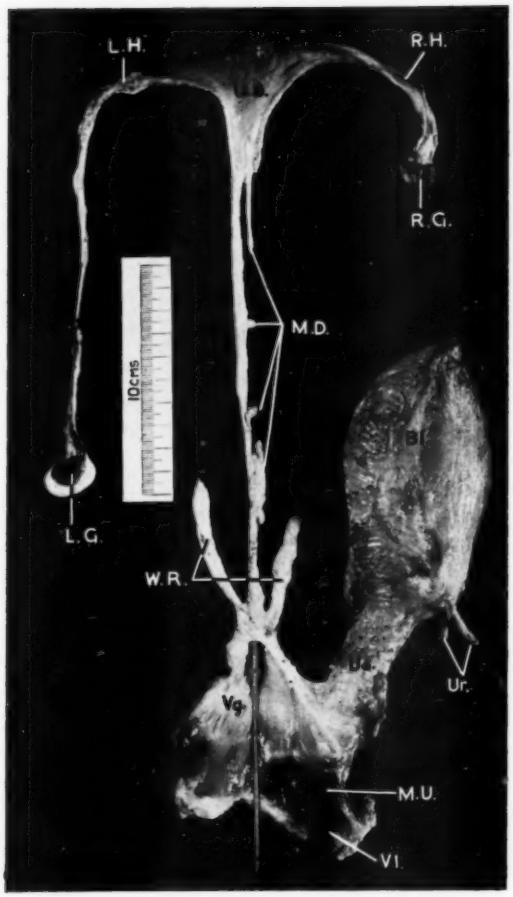

FIG. 7B.

Dorsal view of anterior genital tract of Case No. 10, with incised ventral aspect of vulvo-vagina.

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APPENDIX OF CASE RECORDS

The following abbreviations are intended to facilitate the identification of structure shown in the photographs.

Ad.	...	...	Strands of inflammatory tissue.
A.E.	...	...	Anterior extremity of vagina.
Bl.	...	...	Urinary bladder.
C.	...	...	Cervix.
C.D.	...	...	Cystic distension.
C.L.	...	...	Corpus luteum.
C.T.	...	...	Connective tissue.
F.	...	...	Fimbria.
H.	...	...	Hymen.
L.F.T.	...	...	Left Fallopian tube.
L.H.	...	...	Left uterine horn.
L.O.	...	...	Left ovary.
M.D.	...	...	Muellerian duct.
M.R.	...	...	Gärtner's ducts.
M.U.	...	...	Meatus urinarius.
R.F.T.	...	...	Right Fallopian tube.
R.H.	...	...	Right uterine horn.
R.O.	...	...	Right ovary.
S.F.	...	...	Sub-lumbar fat.
Ua	...	...	Urethra.
U.B.	...	...	Uterine body.
Ur.	...	...	Ureter.
Vl.	...	...	Vulva.
Vg.	...	...	Vagina.
W.R.	...	...	Wolffian or mesonephric remnant.
Y.	...	...	Sub-mucous vaginal channel.
Z.	...	...	Sub-mucous vaginal channel.

No. 1. White Shorthorn heifer, 2½ years old

History

No symptoms were exhibited during life. She was twice seen in oestrus, on 5.12.43 and 10.5.44. On the latter occasion she was to have been inseminated, but on introducing a speculum, a vaginal constriction was discovered. Rectal examination revealed a gross uterine distension with the cervical region ill-defined. She was slaughtered, when fat, on 17.7.44.

Post-mortem examination

See Fig. 1A (dorsal view of genital tract and Fig. 1B (ventral view).

At a distance of 15 cm. from the vulval orifice and 6 cm. anterior to the meatus urinarius, the vagina was partially constricted, just allowing the passage of a little finger; 6 cm. anterior to this constriction, the vagina terminated (A.E. in Fig. 1A) after undergoing a slight increase in diameter.

Emerging from the ventral aspect of the vaginal wall in this region were two parallel cylindrical structures (W.R.), 1 cm. in thickness. These passed forward for 10 cm. and ended bluntly 2 cm. and 3 cm. respectively posterior to the uterine body, being attached to this organ only by thin strands of connective tissue (C.T.). These two structures were firm in consistency and a lumen was just perceptible to the naked eye. Serial cross sections showed that the lumen on the left opened into the anterior tip of the vagina and on the right into a fold of vaginal mucous membrane. The two cords were beaded and slightly tortuous, and they are regarded as the remnants of the mesonephros.

A cervix was completely absent. The uterus was distended with fluid and simulated a right horn pregnancy of two and a half months' duration. The wall, however, was thin, with no cotyledonary areas or foetal membranes palpable externally.

The cavity of the right horn freely communicated with that of the uterine body through a round orifice, 1·5 cm. in diameter. The body itself was distended into a circumscribed spherical mass, the size of a Jaffa orange. The uterine body and right cornu together contained 900 c.c. of a brownish red mucoid fluid, the colour probably resulting from decomposed blood. The cavity of the left horn was separated from the rest of the uterus by a thin septum. The left cornu was somewhat smaller than the right one and contained 300 c.c. of a similar fluid.

Both Fallopian tubes and ovarian bursae were normal. The left ovary was largely comprised of a corpus luteum. The right ovary contained the penultimate corpus luteum and the developing follicle, both the size of a pea.

Breeding

The sire was red-and-white, by a red bull out of a red-and-white cow. The dam was white, by a roan bull out of a roan cow. No in-breeding was traceable amongst these animals. (See also breeding of Heifer No. 7.)

No. 2. White Shorthorn heifer, 2½ years old

History

Service took place, apparently normally, on 6.5.43, but she was again in season on 16.8.43 and 8.12.43. Rectal examination by a veterinary surgeon on two subsequent occasions gave him the impression that she was in calf, but he was a little doubtful about his diagnosis owing to his failure to appreciate anything more definite than a large swelling in the uterine region and to the apparent lack of change between the two examinations. No systemic symptoms were shown at any time.

Rectal exploration on 31.12.43 revealed the uterus to be bilaterally distended with fluid to the size of a three months' pregnancy. It was of about the same tenseness as a gravid uterus but more thin-walled, resembling a full urinary bladder to the touch. On picking up a fold of the uterine wall between the thumb and forefinger, no cotyledons or foetal membranes could be discerned. The cervix was absent and the uterus could be felt coming to an abrupt end posteriorly.

The ovaries were easier to grasp than in a pregnancy of similar size. The left one was quiescent, whilst a large corpus luteum in the right ovary suggested an irregular oestral cycle since oestrus had been exhibited 23 days previously. A complete vaginal constriction was encountered, 12 cm. from the vulval lips.

The heifer was implanted subcutaneously with hexoestrol tablets to induce an artificial lactation. The milk yield being very moderate, the heifer was slaughtered on 18.4.44.

Post-mortem examination

See Fig. 2A (dorsal view of uterus), Fig. 2B (Incised dorsal view of vulvo-vagina).

At the hymeneal site, where the obstruction had *in vivo* appeared complete, there was in fact a central channel, 6 cm. in length, which surprisingly opened directly into the pelvic cavity. It was just possible to push a little finger through this opening, but in life it was tightly closed and the lumen was only a potential one. Dorsal to, and on either side of, this central channel, were two other canals. They were situated superficially under the mucous membrane and ended blindly anteriorly. That on the right (ZZ in Fig. 2B, being opened up throughout its length) was 14 cm. long, whilst the left one (YY in Fig. 2B, opened up at its anterior end only) measured 12 cm.

A cervix was completely absent. The uterine body was represented by a thin band of muscle, 4 cm. in width, showing transverse folds and merging imperceptibly into the broad ligaments on either side.

Ventral to the rudimentary uterine body and running parallel along the pelvic floor, were two firm, cylindrical and partially canalized cords, 1·5 cm. in thickness (W.R.). Blunt anteriorly, they were united posteriorly in the region of the anterior ends of the vaginal canals into a flatter structure. These cords resembled those described in Heifer No. 1. (In Fig. 2B they are incised to demonstrate the lumen.)

The uterine cornua were bilaterally distended to the size of a three months' pregnancy. They were both thin-walled and cyst-like, and a constriction near the termination of each horn produced a sac-like dilatation of the apex (C.D.). The left horn contained 750 c.c. and the right horn 900 c.c. of a thin, dark reddish brown fluid, the discoloration evidently due to decomposed blood. A thin septum separated the two cornua.

The ovaries were both in a quiescent state as a result of the hexoestrol treatment. Fallopian tubes and ovarian bursae were normal.

Breeding

Both parents were roan. There were no common ancestors for four generations back.

No. 3. White Shorthorn heifer, 2½ years old

History unknown.

Post-mortem examination

A partial constriction at the site of the hymen permitted the passage of two little fingers only. The remainder of the vagina and the cervix were fully developed, the latter opening into the uterine body and left uterine horn, in which were discernible the normal caruncular areas.

The thin-walled right cornu, on the other hand, was the size of a two months' pregnancy and contained 600 c.c. of a dark brown mucoid fluid resembling watery black treacle in appearance. A constriction was present near the apex, forming a cyst-like distension (C.D.) of about 2·5 cm. diameter, although the extreme cornual tip was normal.

The left ovary contained a corpus luteum (C.L.) whilst the right ovary was quiescent.

Breeding unknown.

No. 4. White Shorthorn heifer, rising 3 years old

History

This animal had been running out with other heifers and had come into season fairly regularly. When she was to have been inseminated on 15.4.43, a complete vaginal obstruction was discovered 15 cm. from the labia vulvae. *Per rectum*, the cervical and uterine regions were found to be very rudimentary and difficult to palpate. The uterine cornua were irregularly flattened, about 1 cm. in thickness. The left ovary was quiescent; the right one could not be palpated.

The heifer was implanted with stilboestrol tablets with no success, and was slaughtered on 25.10.43.

Post-mortem examination

See Fig. 3 (dorsal view of genital tract).

A vaginal barrier, situated 5 cm. anterior to the urethral opening, was complete and quite impassable. There were, however, a number of small tortuous channels, about 2 mm. in diameter, passing anteriorly from this obstruction. With but one exception, they all ended blindly after a very short course. In the exceptional case, a canal of larger dimensions commenced to the right of, and anterior to, the meatus urinarius, and communicated with the conjoined lumina of the mesonephric remnants. The latter arose ventrally from the vagina as a band-like structure which ran forwards under the rudimentary uterine body to divide after 5 cm. into irregularly thickened and blunt objects (W.R.), 6 cm. in length. The general appearance of these Wolffian remnants was similar to that described in Heifers Nos. 1 and 2.

The uterine body was very rudimentary, consisting of muscular tissue in the form of a thin band, 2·5 cm. wide, which passed into the peritoneum on either side. Its edges were slightly raised and it ended caudally near the hymen. A lumen was absent. The rudimentary body divided anteriorly into two short cornual segments, both of which bore small cyst-like enlargements (C.D.) communicating with the normal Fallopian tubes.

The ovaries were both small, that on the right being quiescent, and the left one containing a small corpus luteum.

Breeding

The sire, dam and one grandam were all roans. The other three grandparents were red, one with a little white on her. No in-breeding could be traced in three generations.

No. 5. White Shorthorn heifer, 2½ years old

History unknown.

Post-mortem examination

See Fig. 4 (dorsal view of anterior part of genital tract).

The hymeneal stricture was complete. The cervix was normal, opening into a perfect right cornu which contained well-marked caruncular formations. The right ovary showed a large corpus luteum and a follicle.

The uterine body and left horn were continuous, commencing caudally as a thin fibrous band and then ballooning into a cystic enlargement the size of a seven weeks' pregnancy; a slight constriction was present near the cornual apex; 300 c.c. of a thin haemorrhagic mucoid fluid was imprisoned on this left side. The left oviduct was normal throughout its length, although longer than the right one, but the fimbriated end (F.) had expanded into a further cystic body, the size of a walnut. The mesosalpinx and left ovary were normal, the latter being quiescent.

Both Gärtner's ducts (M.R.) were observed as cords a few millimetres in thickness. The left one was slightly thicker than the right and extended from the region of the external os to the cystic left horn. The right duct, which was somewhat smaller, arose from the cervical region and terminated in the mesosalpinx.

Breeding unknown.

No. 6. White Shorthorn heifer, rising 3 years old

History

She was served on 26.6.43, 22.7.43, 15.8.43 and 10.9.43. Not having been seen

in oestrus since the late date, she was assumed to be in calf. Rectal examination on 26.1.44 revealed her to be non-pregnant. The left horn and cervix felt normal and the right horn apparently was non-existent. Both ovaries were quiescent. Although there was no marked vaginal stricture, a heifer-size speculum could be introduced only with difficulty. Slaughter was advised, and this took place on 31.5.44.

Post-mortem examination

See Fig. 5A (dorsal view of unopened genital tract) and Fig. 5B (dorsal view of incised genital tract).

There was some narrowing of the vaginal lumen 14 cm. from the vulval lips and 4 cm. anterior to the urethral opening. It was possible, however, to get two fingers through, and no prominent hymeneal vestiges were present.

The cervical canal opened normally into the continuous uterine body and left horn, which contained the usual cotyledonary areas. The intercornual ligament was almost absent. The right horn existed in the form of a short, wide, flat, muscular band, with a small cyst-like structure attached. The latter contained a little mucoid secretion and communicated with the right Fallopian tube.

The oviducts and ovarian adnexa were again normal. The left ovary was quiescent while the right one contained a large corpus luteum and the developing follicle; thus the ovary on the abnormal side was ovulating in two oestral cycles successively.

Breeding

Another white heifer of about the same age, on the same farm, subsequently calved down quite normally. She was a cousin to Heifer No. 6, both grandsires being the same. Moreover, each heifer was in-bred, though not closely, a paternal great-grandsire being identical with the maternal grandsire. All the ancestors for three generations back were either red or roan, the dam and all the bulls being roan.

No. 7. White Shorthorn cow, had 7 calves

History

Conception had occurred readily for the first six pregnancies but three services were necessary for the seventh calf. Since then, four matings had been fruitless. *Per rectum*, the absence of the left uterine horn was readily appreciated.

Post-mortem examination

The whole of the genital apparatus was perfectly normal except for the left uterine horn. The left ovary was in a quiescent state and the right one contained a corpus luteum.

The left cornu was a flattened muscular structure, the apex widening into a cyst-like body the size of a walnut, as in No. 6.

No. 8. Red-and-white Shorthorn cow, had two calves

History

She calved for the first time on 22.10.42, and secondly on 11.11.43, each time after one service only. She was then mated on 4.1.44, 22.2.44 and 26.4.44. Previous rectal exploration had revealed that only one uterine horn was present, and she was slaughtered on 17.7.44.

Post-mortem examination

With the exception of the right uterine horn, the whole genital tract was normal. A normally developed 82-day foetus was removed from the left horn. The left ovary contained a large solid corpus luteum of pregnancy, occupying the whole organ except for a crescent-shaped piece of ovarian tissue at one end. The right ovary contained two pea-sized follicles.

The right cornu was aplastic and resembled that of Heifer No. 6, being in the form of a short, flat, muscular appendage, transversely folded, 3 cm. wide and 1 cm. thick, with no traces of any lumen present.

Breeding

The dam of this cow was unknown, but the roan sire provides exceptional evidence of the hereditary nature of this type of condition in Shorthorns. The following is his record:—

(*a*) He sired Cow No. 8.

(*b*) He was grandsire to Heifer No. 1, showing typical "white heifer disease."

(*c*) He sired a roan cow with aplasia of the left uterine cornu. This cow is still in the herd and is now pregnant for the fourth time.

(*d*) He sired another roan heifer with "white heifer disease," though the abnormality of the genitalia is not quite so extensive as in Heifer No. 1. This animal is still in the herd and has been brought into artificial lactation with oestrogens, reaching a daily peak yield of 24 lb. There is a complete hymeneal stricture, which it was impossible to pierce with safety using various instruments. The cervix, uterus and ovaries appear normal.

(*e*) A white heifer in the herd, now pregnant for the first time, is the great-grand-daughter of a half-brother of the roan bull. In this animal the right cornu is absent and the genital tract clinically resembles that of No. 8.

Thus two cases of "white heifer disease" and two of *uterus unicornis* can be attributed directly to a factor transmitted by this bull, and a further case of the latter can be traced indirectly to him.

No. 9. White Shorthorn heifer, rising two years old. A small patch of red was present on the right ear.

History

She came into season regularly and was inseminated on 18.5.44. The veterinary inseminator suspected "white heifer disease" since it was only just possible to get the inseminating pipette through the hymen. By 29.7.44 she had been in oestrus again but for the last fortnight there had been some straining, accompanied by a slight, haemorrhagic, purulent discharge from the vagina. *Per rectum*, it was difficult to palpate the uterus in great detail owing to the tenesmus induced, but the right cornu seemed abnormal and unduly anchored to the surrounding tissues. The left ovary was quiescent. The right one appeared enveloped in cicatricial tissue, with a smaller nodule affixed nearby. Slaughter took place on 11.9.44.

Post-mortem examination

See Fig. 6A (dorsal view of genital tract) and Fig. 6B (ventral view of genital tract).

It was interesting to note that, although an attempt was made to fatten the heifer for six weeks, she was in comparatively poor condition and the carcase was only passed as fit for manufacturing purposes.

The partial construction of the vaginal passage was situated 12 cm. anterior to the labia vulvae. It was composed of a small circular membraneous elevation (H.) situated 1 cm. anterior to the urethral meatus on the left and 3 cm. on the right, thus producing a diagonal foramen about 1 cm. in diameter and length.

Critical examination revealed that there was also present a number of diverticula running superficially under the vaginal mucous membrane. One passed forward along the midline from a site 4 cm. anterior to the hymen for a distance of 4 cm. (Position indicated by XX in Fig. 6A.) Another longer one (ZZ) commenced to the right of the hymen and ran directly forward as a closed channel for 11 cm.; it then opened into the vaginal lumen again for 2 cm. and finally terminated as a blind sac 4 cm. anteriorly. The diameter of both these canals allowed a finger to be inserted into them. Laterally to the urethral opening were two lesser folds of mucous membrane about 1 cm. deep (Y.).

The rest of the genital tract was normally developed. On the right uterine horn, however, the serosa was inflamed and thin strands of inflammatory tissue (Ad.) passed to the fat in the sub-lumbar (S.F.) and right ovarian regions. The right ovary was entirely surrounded by scar tissue which partially occluded the ovarian bursa. There was a pyosalpinx, localized macroscopically to the ovarian pole of the Fallopian tube, which was distended to the thickness of a cigarette and contained pus of cheesy consistency. This feature was localized into an irregular oval enlargement, the size of a cob-nut, similar to an ovary on palpation, and it was difficult to identify the true organ by this method, even *post mortem*. It was suspected that these cicatricial changes had been accentuated by the attempted insemination.

The left ovary contained a large corpus luteum and a pea-sized follicle. A slightly larger follicle was exhibited in the embedded right ovary.

Breeding

There were no white ancestors for the past three generations, with the exception of the dam. This white cow had had three calves and was of good fertility. No in-breeding was traceable.

No. 10. Roan Shorthorn freemartin, 2½ years old

Post-mortem examination

See Fig. 7A (dorsal view of genital tract) and Fig. 7B (dorsal view of anterior genitalia and incised ventral aspect of vulvo-vagina).

The vulva was normal. A horizontal fleshy pillar connected the left and right vaginal walls just behind the meatus urinarius. Emerging anteriorly from the diminutive vagina was a band, 1·5 cm. wide, which soon divided into three solid tubular structures, 6 mm. in thickness. Through the speculum in the living animal the vaginal constriction would have appeared complete.

The outer two structures were 7 cm. in length and considered to be the Wolffian ducts. The medial tube, its small lumen continuous with that of the vagina, divided after 4 cm. into the two Muellerian ducts. The left one became gradually smaller and more shred-like, eventually giving rise to the just perceptible and very poorly developed long, left uterine horn. The right Muellerian duct was less pronounced, and after the first 3 cm. was merely represented by three nodules, the size of a millet-seed, arranged in linear fashion, becoming apparent again as a thin cord before merging into the equally delicate and shorter right horn. This extremely rudimentary uterus was a very thin and ill-defined tissue, passing imperceptibly into the supporting peritoneum, and the limit of dissection is purely arbitrary.

The gonads were oval organs, not much bigger than a pea. Their appearance, together with the distribution of fat and the apparent epididymes and vasa efferentia leaving them, suggested that the organs were predominantly male. Histological examination revealed them to be ovo-testes.

No. 11. White Shorthorn heifer, rising three years old

History and clinical examination

Regular oestrus was manifested. The heifer had been served by two bulls a total of 12 times, apparently quite normally, with no trace of blood or straining.

A hymeneal constriction, 15 cm. from the labia vulvae, was not quite complete, although a finger could not be pushed through it, in spite of traction of the region with the other hand *per rectum*. The uterine body and cervix were ill-defined and grossly abnormal. Towards the apex of each cornu was palpated a thin-walled cystic swelling; the left one was the size of a hen's egg, the right one somewhat longer. The ovarian bursae appeared normal. The left ovary contained a corpus luteum whilst the right one was quiescent. The Wolffian bodies were distinctly differentiated under the vaginal region as two parallel cords the thickness of a fountain-pen.

No. 12. White Shorthorn heifer, 2½ years old

History and clinical examination

Oestrus had been somewhat intermittent. Four days after the third service, the classical text-book symptoms of continual straining commenced. Two days later, systemic signs were becoming manifest and the animal was going off her food.

The hymeneal ring was completely occluded. *Per rectum*, the uterus and vagina were diffusely and tensely swollen to a size bigger than a football, with the uterine wall thickened. The ovaries and their adnexa were out of reach.

The hymen was ruptured, using a fair amount of force with a trocar and cannula. Over a gallon of thick yellow pus was liberated. Six weeks later, symptoms of tenesmus reappeared and the constriction pierced again without much difficulty The heifer was quickly fattened off for the butcher.

No. 13. White Shorthorn heifer, 2½ years old

History and clinical examination

Heifer had been running with the bull for some time and was seen to be served three months previously. No oestrus had been manifested since.

She was examined twice *per rectum* at a fortnightly interval. The vulvo-vaginal tract was normally patent and the cervix and left horn well developed. The right uterine cornu was thin-walled and distended to the thickness of a cucumber throughout its length. The ovarian bursae were normal. The left ovary was quiescent. The right ovary contained a corpus luteum which was manually removed on each occasion. Service at each induced oestrus was unsuccessful.

The King has by Warrant dated September 4th appointed the Earl of Shaftesbury, K.P., to be one of the Development Commissioners and Chairman of the Commission.

* * * * *

Weekly Wisdom

Modern technology has brought into being a social group with social aspirations and a social status of its own. Its social aspirations for further opportunity of employment can be realized only by the further extension of technical improvements which have encouraged its growth. . . . If it can be enlisted in a task which will offer far greater opportunities for creative service than it now enjoys, the transition from a discredited and demoralized competitive to a rationally planned industrial system is assured. If it is driven by hysterical fear to support any new movement which offers it the prospect of a breathing space, it may become the instrument for destroying democracy and freedom of discourse.—Professor Hogben.

CLINICAL COMMUNICATION

Duodenal Ulceration in the Bitch

W. C. HESKETH, M.R.C.V.S.

Torquay

Subject.—A Dachshund bitch, seven months old.

History.—When first examined the bitch had been vomiting at intervals for the past 24 hours, some of the vomitus containing digested blood. The temperature was 103° F. and she resented abdominal palpation by which a definite thickening of the small intestine could be felt.

On the following day the temperature had dropped to 100·5° F. and remained subnormal subsequently. Vomiting of mucus and bile continued at intervals; the bitch appeared depressed and walked with a staggering gait. She refused milk foods but lapped a little sodium bicarbonate solution and managed to retain a small quantity of finely minced raw beef.

Treatment.—Several doses of a bismuth and kaolin emulsion failed to check the emesis. The stomach was irrigated by tube on three occasions with a 2 per cent. sodium bicarbonate solution. As constipation was present an enema of normal saline was given.

After three days, medicinal measures having failed to improve the condition, an exploratory laparotomy under intravenous nembutal was performed.

The duodenum was severely congested and a portion of it, approximately two inches long, was thickened and cherry-red in colour.

The affected portion was excised and the severed ends of healthy bowel united by lateral anastomosis.

Glucose saline and adrenalin were administered but the bitch died twelve hours later.

Examination of the excised intestine revealed considerable swelling and congestion of the mucous membrane. Three non-perforating ulcers were present. They were roughly circular in outline and quarter-inch to half-inch in diameter. There was also a raised area of irregular shape covered by necrotic membrane. Apart from congestion, the stomach and remainder of the gut appeared normal.

Remarks.—As there was no possibility of the dog having ingested foreign bodies or corrosives of any sort this type of ulceration appears to be similar to the duodenal ulcer of man. Reported cases of this complaint in dogs appear to be few. It is apparently unusual for such a young animal to be affected.

ABSTRACTS

[I.—The Course and Pathology of *Trypanosoma congolense* **(Broden) Disease of Cattle.** T.-W.-Fiennes, R.N., Jones, E.R., & Laws, S.G. (1946) *J. comp. Path.* **56.** 1-27. **II.—***Trypanosoma congolense* **(Broden) Disease of Cattle: The Parenchymatous Lesion and its Relation to the Cellular Defences.** T.-W.-Fiennes, R.N. (1946) *ibid.* **56.** 28-37.]

Adult cattle and calves were experimentally infected with *T. congolense* by subcutaneous injection of infected blood. The parasite appeared in the peripheral blood five to 19 days later, and after 13 to 25 days the animals showed a fluctuating temperature which was clinically of a relapsing type, the fever usually lasting one to two days, with an interval between the temperature rises in most cases of twelve days. Death sometimes occurred at this stage, being preceded by recumbency for 24 to 72 hours. If death did not occur, the animal became subject to a chronic disease, with severe anaemia and fever of a relapsing nature, which might continue for seven to eight months. At the eighth to twelfth week of infection, a prolonged anaemic crisis developed. The general trend in adults was towards death, but in calves was towards recovery. In recovered cases, autosterilization appeared to be complete.

Blood examinations, recorded in detail, revealed the anaemic changes, but with few exceptions the changes recorded in the blood chemistry were within the normal range. Blood chlorides were increased at the time of the anaemic crisis, but no significant changes were observed in the blood sugar.

At autopsy, the most noticeable lesion was a myxoedematous change of the fatty tissue. The cortex of the lymph nodes was fibrosed, and the kidneys always showed signs of necrosis, with some cellular infiltration and fibrosis of the cortex, possibly due to the passage of toxic products of metabolism in the urine. There was emaciation, and gastritis and enteritis were constantly found.

Histologically, the general finding was of a widespread round-cell reaction and fibrosis. There was multiple thrombosis of the smaller blood vessels, and fibrosis of the adventitia, and this suggested that the main lesion was due to multiple infarction leading to parenchymatous degeneration and replacement fibrosis. The occurrence of these lesions in endocrine glands, such as the adrenal and thyroid, might play a significant part in producing the disease picture.

Unlike other species, the trypanosomes were never seen in the tissues in sections. Since the parasites were also not seen in sections in the blood vessels, although their débris was found in numerous macrophages in the tissues, including the adventitia of the vessels, and since they were more numerous in capillary and ear vein blood than in jugular blood, and were also more numerous in the cool of the morning, it seemed possible that the trypanosomes lived chiefly in the skin vessels, and were unable to live and multiply in the internal tissues.

An experiment in a calf gave support to this hypothesis, indicating that the trypanosomes were destroyed in the blood stream, mainly due to serum antibodies and the higher internal temperature, and were disposed of, chiefly as débris, by polymorphs and macrophages. The débris was passed into the tissues, and accumulated there in macrophages. The mobilization of macrophages by desquamation of the endothelium of the smaller blood vessels provided conditions favourable to thrombosis and subsequent multiple infarction. E. C.

NOTES AND NEWS

Diary of Events

Sept. 22nd-27th inclusive.—Annual Meeting and Conference of the National Veterinary Medical Association of Great Britain and Ireland, to be held in London.

Sept. 24th.—Meeting of the Association of Veterinary Inspectors, Friends' House, Euston Road, London, 2 p.m.

Sept. 25th.—Royal (Dick) Veterinary College Alumnus Association Re-union Dinner, Café Royal, Regent Street, London, 8 p.m.

Sept. 27th.—Meeting of the Biochemical Society at Liverpool (Department of Biochemistry, The University), 11 a.m.

Oct. 3rd.—Annual General Meeting of the Central Veterinary Society at the Conway Hall, Red Lion Square, W.C.1, 2 p.m.

Oct. 8th.—Scientific Meeting of the Zoological Society of London, Regent's Park, N.W.8, 5 p.m.

Oct. 11th.—Meeting of the North of Ireland Division, N.V.M.A., at Belfast (Queen's University), 2.30 p.m.

Oct. 16th.—Meeting of the Agriculture Group of the Society of Chemical Industry, in the Physical Chemistry Lecture Theatre, Royal College of Science, South Kensington. "An Experiment in Farming the Sea," Dr. F. Gross, Department of Zoology, University of Edinburgh.

Oct. 19th.—Scientific Meeting of the Nutrition Society (Scottish Group), in the Strathcona Club, The Rowett Research Institute, Bucksburn, Aberdeen, 2.30 p.m.

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New Appointments to the Staff of the Ministry of Agriculture

As was notified in a recent issue, Council, N.V.M.A., has decided that no advertisements for appointments to the veterinary staff of the Animal Health Division of the Ministry of Agriculture shall be accepted for *The Veterinary Record* pending the settlement, in a manner satisfactory to the Association, of the question of the salaries of the Veterinary Officers of the Division.

In the meantime, any members of the profession who may, nevertheless, contemplate applying for such posts, should these be advertised elsewhere, are requested first to communicate with the General Secretary of the Association at 36, Gordon Square, London, W.C.1.

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The Visit to Compton

In connection with this feature of the Congress programme on Wednesday, September 25th, it is regretted that, with the limited restaurant car facilities on the 6.35 p.m. train from Reading to Paddington, returning members cannot be assured of a meal en route. Arrival at 7.20 p.m., however, should enable them to take dinner at their places of accommodation.

Victoria Veterinary Benevolent Fund

THE APPEAL FOR "COVENANTED" SUBSCRIPTIONS

With our issue of September 7th, we circulated an appeal by the President of the Victoria Veterinary Benevolent Fund, together with the requisite form, urging members of the profession to make use of the official provision whereby the Fund can benefit by the amount of income tax on a Member's contribution provided the contributor signs a covenant to continue his or her contribution for seven years or until death if it should occur earlier. We feel that there are many existing and potential members who will gladly take advantage of this method of supporting the Fund which, as was stressed at the annual meeting recently reported in our columns, is most anxious to make the allowances of beneficiaries more appropriate to their needs, particularly now that the increased cost of living is adding so greatly to their difficulties.

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DR. EDWARDS' VISIT TO EGYPT

We have received information that soon after Dr. Edwards arrived in Egypt, on his mission to advise on their educational system, he became involved in the problem of rinderpest. The disease had been stayed following the rigorous application of the old serum-simultaneous method as far back as 1922, but had been lurking dangerously in the country following the use of inactivated vaccine (which has serious disadvantages). Severe outbreaks had been occurring the last few months and the Egyptian Government were anticipating a return to the expensive serum-simultaneous method of vaccination, but Dr. Edwards carried out experiments to ascertain the most suitable of the various goat-adapted strains of rinderpest virus, which now exist, for use in Egyptian cattle. Preliminary vaccination trials were then carried out at public institutions and finally an organized field campaign to control the disease was begun. During July nearly a quarter of the total cattle population of Egypt (about one and a quarter millions) were immunized in this way. These were animals in close proximity to centres of infection. Only a few deaths have been traced to the use of goat virus, due to different circumstances, and the natural disease has been nearly suppressed.

Early in his visit Dr. Edwards had the honour of audience with King Farouk. At His Majesty's request bound volumes of his historical writings were prepared in London and transmitted through the British Embassy, for presentation to the King with his Reports on Veterinary Education in Egypt. The letter of acknowledgment to Dr. Edwards stated, "His Majesty was highly interested in your work, and wished to present to you his best thanks and appreciation for your very interesting publication."

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PERSONAL

Births.—ANDERSON.—At "Inverard," Edinburgh, on September 14th, 1946, to Ruth, wife of W. R. Anderson, M.R.C.V.S., Ratho, a son.

DUNN.—On September 8th, 1946, at Delabole, Cornwall, to Evelyn Frances, wife of J. Drummond Dunn, M.R.C.V.S., a son—Iain Derrick.

Marriage.—YOUNG—TREGONING.—On September 10th, 1946, at St. Peter's, Staines, Archibald Young, M.R.C.V.S., of 51, Riverbank, Staines, to Margaret Helen Tregoning, of 25, Station Crescent, Ashford.

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THE VETERINARY EDUCATIONAL TRUST

Lord Nuffield has forwarded a personal donation of £5,000 to the Veterinary Educational Trust.

Racecards at three October meetings will be doubled in price—a shilling instead of sixpence—and the residue so raised will be given to the Trust.

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POULTRY MISSION TO NORTH AMERICA

The Minister of Agriculture and Fisheries, in conjunction with the Secretary of State for Scotland, has arranged to send a Mission to North America to investigate, on behalf of the agricultural departments and their poultry advisory committees, the progress in the development of the poultry industry that has been made in the United States of America and Canada during recent years, and in particular to examine the stock improvement schemes in both countries. It is contemplated that the Mission will start early in October and will spend a month in the U.S.A. followed by a fortnight in Canada.

It is proposed that the Mission should consist of the following:—R. Coles, B.A., PH.D., M.SC. (Econ.), M.SC. (Agric.), Superintending Poultry Advisory Officer of the Ministry of Agriculture and Fisheries; A. W. Greenwood, D.SC., PH.D., Acting Director, Institute of Animal Genetics, University of Edinburgh; R. F. Gordon, B.SC., M.R.C.V.S., Senior Research Officer, Ministry of Agriculture and Fisheries, Veterinary Laboratory, Weybridge; C. Hedderwick, Somerset Poultry Farm, Bathpool, Taunton, Som.; J. Sutton, The Clifton Pedigree Poultry Farm, Clifton, near Preston; G. Sykes, Queen Manor Farm, Laverstock, Salisbury.

It is hoped that the report of this Mission will be of considerable value to the Government, particularly in connection with enquiries now being made into the methods of poultry stock improvement with a view to the further upgrading of the breeding stock of this country to provide a sound basis of expansion of the industry as soon as circumstances permit.

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WORLD FOOD BOARD PLAN

At the final (plenary) session of the United Nations Food and Agriculture Organization at Copenhagen on September 13th, Sir John Orr surveyed the work of the conference, and said that they could send through the F.A.O. a message of hope to the world, and an assurance that they would not rest until victory had been won in the battle against hunger and poverty. Sixteen members, Sir John Orr continued, were now forming a preparatory commission to work out a detailed plan for a world food board, and three non-members—the Soviet Union, Argentina and Siam—had been asked to co-operate with them.

It was stated at the conference that although Unnra could hand over its organization to the F.A.O. by January 31st, 1947, as intended, Unrra would continue until the end of June, 1947, by which time its funds would be exhausted.

* * * * *

ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

SWINE FEVER:

Kent.—"Sunny Bank," Boyke Lane, Ottinge, Eltham, Canterbury, Kent (Sept. 10th).

Hants.—Dairy Farm, Sherfield English, Romsey, Hants. (Sept. 9th).

Lincs. (*Lindsey*).—Mill House Farm, Mareham-le-Fen, Boston, Lincs. (Sept. 11th); Piggeries at rear of Shakespeare Hotel, High St., Lincoln (Sept. 16th).

Northants.—Thornton Allotments, Harborough Road, Kingsthorpe, Northampton (Sept. 12th).

SHEEP SCAB:

Derbyshire.—Yarncliffe Lodge Farm, Grindleford, Sheffield, Yorks. (Sept. 9th); Upper House Farm, Hayridge Farm, and Hagg Lee Farm, Ashopton, Sheffield, Yorks.; Cote Field Farm, Edale, Sheffield, Yorks.; Mossy Lea, Glossop, Derbyshire; Twitchill Farm, Hope; Gillot Hey Farm and Alport Castle Farm, Ashopton; Highlow Hall Farm, Hathersage and Lady Booth Farm, Edale, Sheffield, Yorks. (Sept. 10th); Coldwell Clough Farm, Mount Famine, Kinder, Hayfield and Ivy House Farm, Little Hayfield, Stockport, Cheshire (Sept. 11th).

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THROMBIN IN SURGERY

First prepared by Mellanby in 1933, the addition of thrombin to blood or plasma produces a clot. The advantages of making use of this property in the surgery of the ear, nose and throat have been reviewed by P. Reading of the aural department, Guy's Hospital (*Brit. Med. J.*, 1946, **2**, 295, *Abstr. Pharm. J.* **157**, 168). He found it to have little value in arresting haemorrhage from the tonsil fossa after tonsillectomy or epistaxis; on the other hand, when used in nasal and mastoid surgery it made it unnecessary to use gauze packing. Thrombin is supplied in ampoules (Parke Davis & Co.) each containing 50,000 Iowa units; a unit is the amount of thrombin required to clot 1 ml of standard fibrinogen solution in 15 seconds. For use the contents of one ampoule of thrombin are dissolved in 5 mils of sterile water. The solution can be applied directly to a wound or a spray can be used.

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A Dutch abstracting service in English somewhat on the lines of the Zentralblätter published in Germany before the war by Julius Springer has been proposed, states the *British Medical Journal*. As recently announced in our columns, the British Medical Association is itself to start next year two monthly abstracting journals.

Particulars of the autumn series of lectures and practical demonstrations, arranged by the National Horse Association of Great Britain, to be held in the Riding School, Hyde Park Barracks, can be obtained from the Secretary of the Association at 43, Russell Square, W.C.1.

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"Airborne's wins in the Derby and St. Leger come at a time when they are most acceptable to the British bloodstock industry," states the Racing Correspondent of *The Times*. "He is, of course, by Precipitation from the grey mare Bouquet, dam of Fragrant View, Bulldozer, and Heliotrope. Bouquet was by Buchan out of Hellespont, by Gay Crusader. Precipitation has now sired the winners of four classic races, Why Hurry, Chamossaire, and this year's Derby and St. Leger winner. A stout sire line has been advertised and a future British stallion of great value has received his hall-mark."

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SCHEME FOR THE CONTROL OF DISEASES OF DAIRY CATTLE

STATEMENT SHOWING THE NUMBER OF UNDERTAKINGS NOTIFIED TO THE MINISTRY OF AGRICULTURE DURING THE MONTH ENDED AUGUST 31ST, 1946

County	Undertakings Notified		Total Undertakings		
	During Month	Previously	Number	Number of Cattle	
				Cows	Heifers
ENGLAND					
Bedford	—	34	34	777	435
Berks	1	82	83	3,761	2,000
Bucks	—	71	71	2,550	1,307
Cambridge	—	10	10	199	79
Chester	—	316	316	10,510	4,138
Cornwall	—	4	4	72	75
Cumberland	—	57	57	1,454	1,226
Derby	—	317	317	9,072	5,179
Devon	3	310	313	4,614	2,671
Dorset	—	64	64	2,049	1,121
Durham	5	243	248	5,238	2,247
Essex	—	207	207	6,937	4,328
Gloucester	—	93	93	2,485	1,776
Hampshire	1	334	335	9,670	6,657
Hereford	—	10	10	280	157
Hertford	—	79	79	2,334	1,547
Hunts	—	7	7	280	168
Isle of Ely	—	1	1	57	21
Isle of Wight	—	4	4	52	39
Kent	—	156	156	3,649	2,216
Lancs	1	157	158	4,543	1,607
Leics	2	101	103	2,582	1,946
Lincs (Holland)	—	3	3	25	11
Lincs (Kesteven)	—	23	23	321	192
Lincs (Lindsey)	—	102	102	1,975	1,196
Middlesex	—	13	13	419	219
Norfolk	—	132	132	4,267	3,029
Northants	—	67	67	1,896	1,660
Northumberland	—	53	53	1,671	1,172
Notts	1	163	164	3,585	2,256
Oxford	—	40	40	1,100	1,852
Rutland	1	1	2	36	17
Salop	—	222	222	6,446	3,432
Soke of Peterborough	—	—	—	—	—
Somerset	2	243	245	6,364	2,990
Staffs	1	176	177	4,424	3,642
Suffolk, E.	—	56	56	1,231	849
Suffolk, W.	—	48	48	1,010	744
Surrey	3	94	97	2,836	1,382
Sussex, E.	1	163	164	4,136	2,629
Sussex, W.	—	102	102	2,824	1,627
Warwick	—	117	117	2,675	1,894
Westmorland	—	7	7	176	173
Wilts	—	83	83	3,376	1,468
Worcester	2	136	138	2,612	1,314
Yorks, E.R.	—	95	95	1,671	906
Yorks, N.R.	—	100	100	3,217	197
Yorks, W.R.	—	240	240	5,764	2,389
WALES					
Anglesey	—	48	48	829	596
Brecon	—	12	12	204	129
Caernarvon	—	63	63	910	473
Cardigan	1	38	39	702	453
Carmarthen	1	234	235	4,430	2,361
Denbigh	—	29	29	596	291
Flint	—	44	44	1,002	566
Glamorgan	—	91	91	1,459	644
Merioneth	—	10	10	137	65
Monmouth	—	53	53	1,241	688
Montgomery	—	14	14	283	248
Pembroke	—	40	40	845	707
Radnor	—	—	—	—	—
TOTALS	26	5,812	5,838	149,247	85,401

Notes.—(1) Operative periods of undertakings: 1 year, 1,569; 2 years, 402; 3 years, 3,867. (2) Undertakings renewed for further periods: 1 year, 2,089; 2 years, 235; 3 years, 821. (3) Undertakings not renewed at ends of operative periods, 2,128. (4) The figures showing the number of undertakings notified during the month relate to entirely fresh undertakings and do not include those renewed for further periods. Undertakings which have been cancelled or not renewed are not included in the figures for previous notifications.

County	Undertakings Notified		Total Undertakings		
	During Month	Previously	Number	Number of Cattle	
				Cows	Heifers
SCOTLAND					
Aberdeen	—	18	18	942	438
Angus	—	16	16	626	430
Argyll	—	2	2	33	74
Ayr	—	13	13	416	259
Banff	—	1	1	129	20
Berwick	—	—	—	—	—
Bute	—	—	—	—	—
Caithness	—	—	—	—	—
Clackmannan	—	4	4	161	103
Dumfries	—	12	12	612	568
Dunbarton	—	1	1	60	40
East Lothian	—	1	1	20	8
Fife	—	26	26	939	534
Inverness	—	2	2	106	46
Kincardine	—	2	2	81	48
Kinross	—	3	3	62	43
Kirkcudbright	—	9	9	980	755
Lanark	—	7	7	296	225
Midlothian	—	—	—	—	—
Moray	—	—	—	—	—
Nairn	—	—	—	—	—
Orkney	—	—	—	—	—
Peebles	—	—	—	—	—
Perth	—	7	7	253	264
Renfrew	—	4	4	151	101
Ross-shire	—	1	1	58	43
Roxburgh	—	—	—	—	—
Selkirk	—	—	—	—	—
Stirling	—	9	9	293	277
Sutherland	—	2	2	41	6
West Lothian	—	—	—	—	—
Wigtown	—	15	15	994	555
Zetland	—	—	—	—	—
TOTALS	—	155	155	7,244	4,777

Notes.—(1) Duration of undertakings: 1 year, 48; 2 years, 8; 3 years, 99. (2) Undertakings renewed for a further period (included in column 2 of statement): 1 year, 84; 2 years, 9; 3 years, 65. (3) Undertakings expired and not renewed (not included in column 2 of statement): 235. (4) The figures showing the number of undertakings notified during the month relate to entirely fresh undertakings.

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CO-OPERATION IN TUBERCULOSIS ERADICATION

"It is highly probable," says *The Farmer and Stock-Breeder* in a recent issue, "that the results of official and unofficial comparisons of British with American methods of improvement in the health of dairy herds will soon be brought under review by the Ministry with the idea of making changes, possibly in our attestation methods and certainly in our approach to the very difficult question of disease eradication, particularly with regard to tuberculosis. It is not too much to hope that the Ministry will widen the scope of its survey so as to comprise the unofficial view as well as the official view. Here the future plans are bound to rest upon some combination of the voluntary scheme of attestation with the compulsory clearing of suitable areas. As a beginning, this seems inescapable. In the panic which seized the Ministry soon after war broke out, the Attested Herds scheme was one of the plans to be jettisoned. The official mind of those days was not gifted with sufficient foresight to imagine that subsequent Ministries of Food would establish good clean milk as priority number one in the list of foods. They atoned somewhat, in 1944, by an abbreviated scheme designed more to remove the reproach than to make any amends to the dairy farmer who had been preparing his farm and his cattle for attestation. Still, with the more enlightened mind recently shown in many quarters we can afford to let that pass.

"If as we believe they will, the Ministry take farmers and their organizations into their full confidence, they will probably find that the 'ordinary producer' is more awake to the desirability of his active co-operation in disease elimination than they have hitherto imagined. There could be no more convincing illustration of this than the fact that at the recent United Counties Show held at Carmarthen, embracing the counties of Carmarthen, Pembroke and Cardigan, only tested cattle were allowed to enter. This area, with the collaboration of progressive auctioneers, has set itself the task of discouraging imported cattle and encouraging home breeding. In Scotland there are equally appropriate areas which deserve full credit for their progressive attitude.

"Another consideration that must constantly be borne in mind in any review of how to give fresh impetus to disease eradication is the desirability of offsetting any compulsory scheme by placing less emphasis on pasteurization. The two things are incompatible. The case for pasteurization rests on the supposed contamination of the product with disease. An area which takes the trouble to clean up its herds to the point of eradication of disease should be entitled to claim that its product should not be subjected to the same safety precautions that may be necessary elsewhere.

"As we see it, the main difficulty lies in this adaptation of a voluntary with a compulsory scheme. Not so much in its immediate application, perhaps, as giving rise to a crop of anomalies and hard cases difficult to adjust over the period of the quarter of a century which, it is estimated, it would take before eradication is appreciably nearer attainment.

"Next among the problems, if not first, is the supply of the sufficient numbers of veterinary surgeons to carry out the new requirements for the Attested Scheme, whatever they may be. It is this expansion which will cause the greatest number of headaches, and we may now have to pay severely for the extent to which the number of veterinary surgeons was denuded during recent mechanized warfare.

"The Government and the veterinary organizations, with, we hope, the collaboration of the farming, will have to devise methods which will work not merely efficiently but quickly even with a programme designed to cover 25 years."

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MINISTRY OF AGRICULTURE NEWS SERVICE

Silage and Winter Stock-feeding.—It is obvious that the welfare of farm animals during the coming winter will depend very largely upon the ingenuity and forethought of farmers. . . . "Milk in North America," the first of a new series of reports, "Agriculture Overseas," published by H.M. Stationery Office, shows in Appendix 1 the important part that silage plays in maintaining the milk supply of that continent. On every dairy farm in Canada and the United States, the silo is a piece of standard equipment. Sometimes it is a pit silo, but more usually it is one of tower design, and is placed at the end of the cowshed. Maize is used for silage more than any other crop and together with home-grown foods forms the mainstay of the dairy cow's ration throughout the long winter months. This winter our own farmers will need all the feed upon which they can lay their hands, and first quality silage, fed along with medium hay or other forage crops for maintenance, will supply all the requirements for yields of two gallons—and as there is likely to be a good deal of medium hay about this season it would be well to have some good silage with which it can be fed.

. . . . .

Foot Rot in Sheep.—Foot rot is a disease which if left unchecked can prove very costly. The most effective method of prevention is routine trimming of the sheep's feet. This also ensures examination of the feet for wounds and split hooves and the early recognition of injuries and of cases of foot rot before they become advanced. It is of advantage to walk the flock periodically through shallow baths of antiseptic solution made up in the proportion of 1 lb. of copper sulphate to two gallons of water for preventive action, or double the strength when used for affected sheep. A sharp knife must be used freely in treating early cases. Sufficient horn must be pared away to allow free drainage of matter and penetration of the antiseptic solution. Affected sheep should be put through the foot bath at frequent intervals. This simple method of treatment will give good results in quite a short time. Even fairly advanced cases will respond well. When cutting has been deep or the exposed surface is extensive, a piece of clean tow soaked in antiseptic should be applied and kept in position by a bandage.

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Premium Bulls.—Following last year's success, by heading the list of Shorthorn Recorded Herds, Messrs. W. Davies & Son, of Brooklands Farm, Balsall Common, Nr. Coventry, have recently won the Small Herds Competition sponsored by the Warwickshire County War Agricultural Executive Committee. For almost a quarter of a century bulls, purchased under the Ministry's Livestock Improvement Scheme, have been located in the district. Since 1933, when Messrs. Davies became the keepers of an approved Dairy Shorthorn bull, they have persistently used bulls with good milk records.

The importance of using a good bull, of a type suitable to the herd, whether dairy or beef, cannot be too strongly emphasized. On the recommendation of its Livestock Officers the Ministry awards grants to societies who provide bulls for the service of cows belonging to their members. These grants are of great benefit to the smaller farmers. Further particulars may be obtained on application to the Ministry at 4, Bickenhall Mansions, Baker Street, London, W.1.

. . . . .

A long record of consistently good milk yields in a herd is more important and a greater achievement than any individual high record. Success in forcing a high record of production especially during first or second lactation may lead to reduced fertility and a shortened life.

The *Farmer and Stock-Breeder* reports that a recent count on the Island of Sark shows that there are there three bulls, 80 cows and 39 heifers, all of pure Guernsey breed, and all have recently been tested for tuberculosis without any reaction. Contagious abortion is also unknown on the island.

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HEAD-SHAKING IN HORSES

In response to the note on the above by Mr. J. W. Holmes, included in the report of cases discussed by the Royal Counties Division, published in our issue of August 10th, and also to the letter of Mr. J. F. D. Tutt in the issue of August 17th, Mr. F. V. Holmboe, a veterinary surgeon of Stavanger, Norway, has very kindly sent a translation of an article by Wenn, formerly District Veterinary Surgeon, that appeared in the *Norsk Veterinartidsskrift* in 1926. The translation is available for loan to any who may apply for it to 36, Gordon Square, W.C.1.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal views of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

Notice to Correspondents

The Editorial Committee regrets that, the paper supply situation having deteriorated, it has become necessary to ask correspondents again to accept a limitation on the length of letters submitted for publication. Accordingly, contributors to our Correspondence Columns are requested to note that, until further intimation is made, their communications must not exceed 350 words.

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HEAD-SHAKING IN HORSES

Sir,—Many years ago my advice was asked by the owner of a valuable hunter who complained that directly he started to ride, the horse shook his head so badly that it was almost impossible to ride him.

After careful examination I considered the horse had an infection of one of the frontal sinuses. With the permission of the owner I operated on the near sinus and found what appeared to me to be pus rolled into a ball about the size of a marble: this was rattling in the sinus when the horse moved his head. Following the operation there was no further trouble.

Yours faithfully,

Abbottsford, Princes Street, Nuneaton. H. A. Barrett.

September 9th, 1946

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DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV).

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Parasitic Mange*	Sheep Scab	Swine Fever
August 16th to 31st, 1946 ...	1	—	—	2	9
Corresponding period in—					
1945 ...	7	—	—	1	43
1944 ...	4	18	—	5	117
1943 ...	9	—	—	5	24
Total Jan. 1st to Aug. 31st, 1946 ...	65	31	7	41	306
Corresponding period in—					
1945 ...	78	101	6	49	659
1944 ...	127	63	6	67	724
1943 ...	197	12	6	110	357

NOTE.—The figures for the current year are approximate only.
* Excluding outbreaks in Army Horses.

Tuberculosis (Attested Herds) Schemes

The number of Attested Herds, *i.e.*, herds officially certified as free from Tuberculosis as at August 31st, 1946, was as follows:—

England	Wales	Scotland	Total (Great Britain)
6,341	10,070	7,179	23,590